



English Translation of Japanese Office Action

Reason 1

Claims: 1, 3, 4, 10

References: 1, 2

The cited references 1 and 2 describe a reformer that includes determining means for determining the extent of degradation of a reforming catalyst based on the temperature of the reforming catalyst obtained by reforming catalysts temperature obtaining means, and also describes that gas serving as a reforming material is the mixture of fuel and air. In addition, the cited references 1 and 2 describe that degradation is determined based on a temperature in an outlet side of reformat gas (temperature at a downstream end) and a deviation between the outlet temperature and the inlet temperature of reformat gas (see paragraphs [0024], [0028], and [0029] and FIG. 1 of the cited reference 1, and paragraphs [0037], [0062], and [0063], and FIG. 14 of the cited reference 2).

Reason 2

Claims: 1 to 7, 9, 10

References: 1 to 4

(1) Claims 1, 3, 4, 10

See the Reason 1 above

(2) Claims 2, 5 to 7

FIG. 9 of the cited reference 3 shows a distribution of the temperatures when the reforming catalyst degrades as time passes. For example, FIG. 9 shows that if degradation progresses as time passes, the peak temperature decreases. FIG. 9 also shows that the temperature temporarily increases as degradation progresses and then decreases around a temperature sensor 15b-2. In addition, it is obvious to a person skilled in the art that the catalyst temperature affected by the reaction heat differs depending on the air-fuel ratio.

Accordingly, as described in the cited references 1 and 2, when determining degradation based on the temperature of the reforming catalyst, a person skilled in the art could have easily devised a technology, with reference to FIG. 9 of the cited reference 3, to determine that the reforming catalyst degrades if the temperature of the reforming catalyst is lower than a predetermined temperature determined accordingly to the air-fuel ratio, and if the temperature at a downstream end temporarily increases and then decreases. Further, since the catalyst temperature increases as the air-fuel mixture

is supplied, and the temperature differs depending on the extent of degradation as described in the cited references 1 to 3, there is no specific characteristic in the invention of the present application in which the degradation is determined based on the extent of increase of the catalyst temperature or the extent of decrease of the catalyst temperature after starting supply of the air-fuel mixture.

(3) Claim 9

The cited reference 4 describes that the air-fuel ratio is adjusted in accordance with the temperature of the reforming catalyst measured (see paragraph [0034], the first and second lines).

Therefore, when determining degradation of the reforming catalyst based on the descriptions in cited references 1 to 3, a person skilled in the art could have easily devised a technology to adjust the air-fuel ratio in accordance with the temperature of the reforming catalyst measured, in consideration of the description in the cited reference 4.

Reason 3

(1) It is not clearly defined whether “the temperature of the reforming catalyst” described in claim 2 means the average temperature of the reforming catalyst, and if “the temperature of the reforming catalyst” includes other temperatures than the average temperature, it is not clearly described which temperature of which part of the reforming catalyst is included. In the detailed description of the exemplary embodiments of the specification, this point seems to be described with reference to FIG. 5, which is a drawing with respect to the average temperature of the catalyst floor. However, it is not clearly described whether other temperatures than the average temperature may be similarly used as the temperature described in claim 2.

(2) Each of claims 3 to 9 refers to its antecedent claim. However, the method of determining degradation described in the antecedent claim seems different from the method of the same described in the sub-claim that refers to the antecedent claim (e.g. the case where claim 4 refers to claim 2, and the case where claim 6 refers to any one of claims 2 to 5). Therefore, it is not clearly defined how the degradation is determined in the invention claimed in claims 3 to 9 (e.g. whether the degradation is determined in a plurality of methods claimed in the antecedent claim and sub-claims).

(3) The descriptions “extent of temperature increase” and “extent of temperature decrease” in claim 6 are unclear because the specific conditions where the temperature change is generated are not clearly defined. In the detailed description of the exemplary embodiments of the specification, degradation is determined based on the

extent of temperature increase or the extent of temperature decrease when the air-fuel mixture supply is started or when the air-fuel ratio of the air-fuel mixture is changed. However, it is not clearly defined that claim 6 includes the extent of temperature increase and the extent of temperature decrease under other specific conditions.

(4) The description in claim 9 is unclear because claim 9 does not alternatively refer to the antecedent claims (e.g. "according to any one of claims 1 to 8" is preferable).

List of Cited References

1. Japanese Patent Application Publication No. 2002-124286
2. Japanese Patent Application Publication No. 2000-063104
3. Japanese Patent Application Publication No. 2001-226101
4. Japanese Patent Application Publication No. 2000-053403